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March 8, 1958

VOL. 73 NO. 10 PAGES 145-160

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

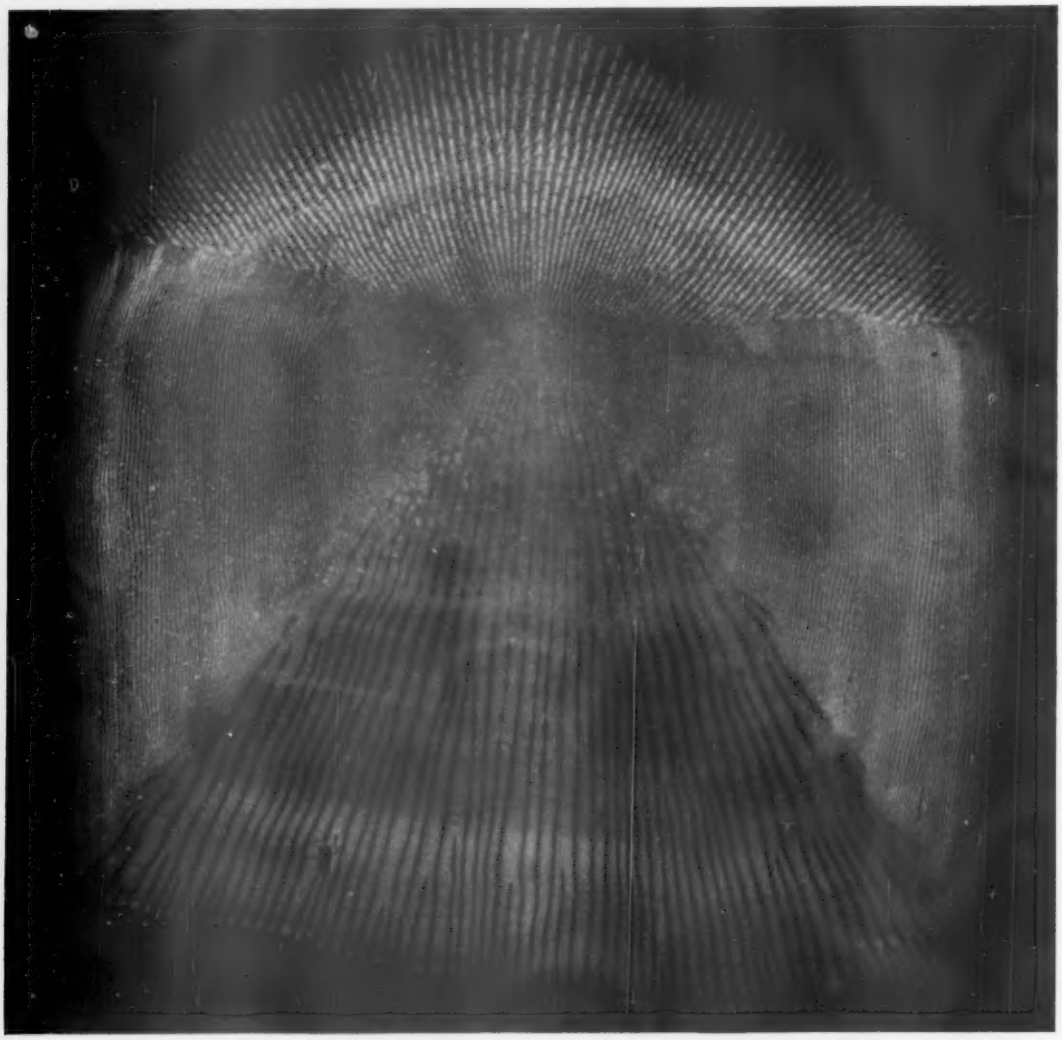
Winners at NBS

See Page 151

A SCIENCE SERVICE PUBLICATION

Kodak reports on:

a fish story with a picture to prove it . . . extending our list of refractive index liquids at both ends



This is a microradiograph of a striped bass scale. In microradiography one passes low-voltage x-rays through a specimen to a special fine-grain photographic emulsion in intimate contact with it. The resulting photographic image then becomes a subject for conventional photographic enlargement or photomicrography. If you already know that much, there is then some point in requesting of Eastman Kodak Company, Special Sensitized Products Division, Rochester 4, N. Y., information about an improved material for this work which we hope to have available in the near future. The same source can also provide a recently updated bibliography on results and techniques with microradiography. But don't ask us about striped bass, their stripes, or their scales. Ask the Fish and Wildlife Service of the U. S. Department of the Interior in Washington.

Bottled goods, 1.269 to 1.840

Page 222 of "Eastman Organic Chemicals, List No. 40" is devoted to a price catalog of 40 liquids arranged in order of refractive index and an offer to supply them in 25-cc glass-stoppered bottles when ordered in lots of 10 or more. After the book was printed, along came *Trifluoroacetic Anhydride* (Eastman 7386) with a refractive index of 1.269 to extend the list at the low end, and now comes *Diiodophenylarsine* (Eastman 7439) to stretch it at the other end to 1.840, way beyond 1.7400 where *Diiodomethane* (Eastman 167) had hitherto left it. It is heavy stuff ($D_4^{20} = 2.565$), and dark red is its inherent color, but it is not very volatile (BP 142-144/1 mm) and it's a definite chemical entity instead of one of those inorganic cookbook broths that have been in use for high-index measurements in mineralogy.

We didn't invent Diiodophenylarsine. *George Joseph Burrows and Eustace Ebenezer Turner did, 38 years ago or more in Sydney, Australia. All we've done is to add it to the list of some 3600 miscellaneous organic compounds obtainable in laboratory quantities from Distillation Products Industries, Rochester 3, N. Y. (Division of Eastman Kodak Company).*

Kodak
TRADE MARK

ENGINEERING

Build Solar House

One solution to the problem of diminishing fuel resources is to utilize the sun's heat. Believed practical only in southern climates, a northern solar house has been built.

➤ THE FIRST full-scale sun-heated house to meet today's living requirements has been built by a Massachusetts Institute of Technology team of engineers and architects.

Located in Lexington, Mass., a Boston community suburb, the M.I.T. "hot house" is a sleek two-story, three bedroom residence ready for occupancy. It will be sold to a private family.

When this happens, both the house and family will become part of a unique and continuing experiment into the practical applications of solar energy. M.I.T. engineers will still retain separate access to a basement equipment and instrument room to gather data on the solar heating system.

The most striking feature of the house is its solar collector, the equipment used to trap the sun's energy for heating purposes. The collector consists of 640 square feet of glass, two layers thick, over a similar area of thin (.025 of an inch thick) aluminum sheet painted black to help absorb heat. The great expanse of glass forms all of the visible roof and wall of the building's south side.

According to the M.I.T. solar house builders, "while the aluminum sheet absorbs the solar energy, the glass serves the same purpose it does in a greenhouse—it lets the sunshine in, but keeps the longer waves of heat energy from passing right back out again."

Once the energy is trapped it must then be stored for use. To do this, water is circulated through copper tubes attached to the aluminum sheet and the captured solar energy is transferred from the sheet to the water. The hot water is stored, in turn, in a 1,500-gallon basement tank.

To heat the house, the engineers explain, the hot water in the tank is pumped through a heat exchanger, that functions like an automobile radiator, to transfer the heat from the water to a stream of air. It is this warm air that heats the living spaces of the house.

The house is the result of 20 years of research and was built to show that enough facts and equipment are now available to construct a solar house for modern living in a northern climate.

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SOLAR HOUSE—A snow-swept view of the first solar house designed to meet modern living requirements in a northern climate shows part of the mechanism for "catching" the sun's heat. At the right is the glass-faced solar collector that forms all the visible south side of the house. At the extreme left is part of the screened porch that provides outdoor living space for the second-story living room. The house is seen from the southwest.

ASTRONOMY

Use Binoculars to See Year's First New Comet

➤ THE YEAR'S first new comet can now be seen high in the southern sky using binoculars, if weather permits.

The diffuse object has been named Comet Burnham after its discoverer, Robert Burnham Jr., of Prescott, Ariz., who found it while working at Lowell Observatory, Flagstaff, Ariz. It is the second comet Mr. Burnham has spotted within five months.

Miss Elizabeth Roemer of the U. S. Naval Observatory, Flagstaff, confirmed the discovery within two hours and reported the details to fellow astronomers at the U. S. Naval Observatory, Washington, D. C.

Comet Burnham's overall brightness rates as magnitude nine on the astronomer's scale, much too faint to be seen without optical aid. The central condensation, or nucleus, is considerably fainter, rating magnitude 15 when photographed.

The object was discovered at 10:00 p.m., EST, Feb. 21. Its position on Feb. 25 was five hours, 54.47 minutes in right ascension and plus 11 degrees, 9.13 minutes in declination. Miss Roemer reported Comet Burnham's daily motion is plus 51 minutes in right ascension and plus 22 minutes in declination.

Whether Comet Burnham will brighten or become fainter will not be known until further observations are made. It is moving slowly north and east in the sky.

The object is described as diffuse, with central condensation or nucleus; nothing was reported about its tail.

News of the comet's discovery was cabled to Harvard College Observatory, Cambridge, Mass., clearing house for astronomical information in the Western Hemisphere. Dr. E. C. Slipher, acting director of the Lowell Observatory, reported the discovery.

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ELECTRONICS

Electronic "Book" Shows Off in Ten Languages

➤ AN ELECTRONIC history "book," an International Business Machines 305 RAMAC computer, is destined to perform its feats of historical marvel at the Brussels World's Fair beginning April 17 as part of the U. S. Pavilion exhibit.

The outline of world history, dating from the Fourth Century B. C. down to the present is recorded in the computer's memory in ten languages, including Russian and Interlingua, a universal language that can be readily understood by most visitors to the Fair regardless of their national language.

In less than two-thirds of a second, the insertion of a random year on the RAMAC keyboard, is followed by an electric typewriter printing out a concise statement of the major events of that year.

In addition to Russian and Interlingua, RAMAC will answer historical dates in English, French, Italian, Dutch, Spanish, Swedish, Portuguese, and German.

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GENERAL SCIENCE

Decide Careers Early

➤ FORTY GIFTED young scientists have revealed that their enthusiasm for lifetime careers in science was fired very early in their lives.

According to the winners of the 1958 Science Talent Search for the Westinghouse Science Scholarships and Awards, the age at which they had their first yen to be a scientist ranged from three to 15, with the greatest number charted in the years between six and 10.

About a fourth of them have always wanted to be an astronomer, a physicist, a chemist or a teacher, for example. If they wandered off the path, lured by a temporary interest in some other career, they came back the next time science appeared on the scene.

In the majority of cases, various fields of science have been "tried on for size" as the youngster became aware of them, with the highest number of their present career choices having been made at the ages of 10, 15 and 16.

One boy relates that from the time he was seven years old he has known that he wanted to "satisfy a growing curiosity about the world around me." Even at that tender age he experimented a great deal and once devoted several days to seeing whether it was possible to dissolve coffee grounds.

***BURNED MISSILE** — Air friction heat burned the black waffle pattern on the Lockheed X-7 ramjet missile that recently set new speed and altitude records. The parachute and nose spike enable it to be recovered and reflown.*

Another boy developed an intense interest in astronomy when he was ten years old, acquired a telescope, and has wanted to be an astronomer ever since.

Many of these high school seniors mention home influences, books on science and scientists, chemistry sets, and science courses in school as prime reasons for their interest in their chosen specialties. One student credits the results of aptitude and interest tests and his own increasing maturity with giving him sufficient self-understanding to know that he wanted to be a scientist.

Asked what specific contribution they would like to make during their lifetime, these young people describe some very definite and admirable ambitions. They hope to accomplish major breakthroughs toward artificial photosynthesis, chemicals to retard aging, the "secret of life" and a cure for cancer. They anticipate greater understanding of magnetic fields and fusion processes, and of mental illness through biochemical research in psychopathology.

One boy would like to provide a stepping stone to new concepts and theories of the universe by developing a contribution like Planck's quantum theory or Einstein's special theory of relativity. Another 18-year-old, who has been an inspired "builder" all his life, hopes to develop a research tool for physical chemistry that will correspond to the bevatron and cyclotron in the field of nuclear chemistry.

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AERONAUTICS

Ramjet Missile Sets Speed-Altitude Marks

➤ THE X-7 RAMJET missile has set a new speed and altitude mark for its propulsion type, the Air Force has reported, but exact details have not been made public.

The records were set on separate flights of the X-7 over the desert proving range at Alamogordo, N.M. The X-7, built by Lockheed's missile systems division for the Air Force's Air Research and Development Command, is used to prove powerful ramjet engines that propel some of the nation's most advanced defense weapons.

It is recoverable by parachute and a nose spike so that it can be flown time and again.

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ASTRONAUTICS

Economic Reasons May Slow Space Travel Era

➤ THE AGE of space travel may be farther in the future than many persons expect, not for technical but for economic and social reasons.

The interest in space flight may soon drop from its current high level, Dr. Donald Michael of Dunlap and Associates, Inc., Stamford, Conn., warned the American Rocket Society meeting in New York. He suggested space exploration might by 1975 be "just another social problem in allocation of effort, money, prestige, emotional involvement and sheer day-to-day expedience."

In 18 years, Dr. Michael said, one person in ten of the expected U. S. population of 225,000,000 will be 65 or older. He concluded "there is no reason to believe that the adventure or rewards going to the strong and youthful and deriving from space exploration will inspire these elder citizens to place supporting governmental expenditures for space research above expenditures for increased social security, old age insurance, and other services which will inherently be more appealing to them."

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ENTOMOLOGY

Study Mosquito Control

Public health officials maintain a continuous alert, studying the mosquito carriers of yellow fever, to prevent the United States from being hit by an outbreak of the disease.

➤ NUMBERS of the yellow fever mosquito, *Aedes aegypti,* in the United States are declining, U. S. Public Health Service researchers reported to the American Mosquito Control Association meeting in Washington, D. C.

Two surveys recently conducted in more than 60 southern communities show that both the area of infestation and the northern limits of the disease carrier have been decreasing, George R. Hayes Jr., and Milton E. Tinker of the Public Health Service's Communicable Disease Center in Atlanta, Ga., pointed out.

However, Public Health Service officials are continuing to investigate and survey aegypti breeding areas, particularly those near international ports. Only Mexico separates the U. S. from the yellow fever areas of Central America. One survey, begun in the summer of 1957 and still going on, resulted in the discovery of the aegypti mosquito on Key West. Another survey turned up another natural carrier of yellow fever, *Haemagogus equinus,* in Brownsville, Tex.

J. H. Hughes, John E. Porter, L. G. Strom and C. B. Joyce, all with the division of foreign quarantine of the Public Health Service, Washington, reported on detection and control activities in international port areas.

More than 325 scientists and public health officials attended the meeting. They came from 28 states, Hawaii, Puerto Rico, England, Canada, Mexico, Jamaica, Nepal and India.

Bite Causes Allergy

➤ IT IS NOT the kind of mosquito biting you that causes a painful reaction but rather the number of times you are bitten.

This means that persons who suffer acute reactions to mosquito bites are having an allergic reaction, a Canadian researcher explained to scientists attending the Association meeting. Before there is any response to the insect's bite, there must be previous exposure.

Working with rabbits, Dr. A. S. West of Queen's University, Kingston, Ontario, found it takes 10 to 12 mosquito bites before the animal is sensitized and reacts. Bitten at the rate of twice a day, the test animals reached a peak sensitivity to the substance causing the allergic reaction by the 13th day.

Experiments designed to show if there is some relationship between different species of mosquito and reactions to their bites are negative so far. Rabbits sensitized to one species were test bitten with others. Reactions seem to depend only on the rabbit's state of sensitivity or the number of times the animal had been bitten.

Population movement to northern Canada has emphasized the problem of mosquito control in that area, Dr. West pointed out. The newcomers frequently suffer acute reactions to the bites of insects. There is a need for greater knowledge of the nature of both the reaction and the substance causing it.

B. N. Anne Hudson, also of Queen's University, was associated with Dr. West in this study.

In other research reported to the meeting, Travis E. McNeel of the Pan American Sanitary Bureau, Mexico City, described tests of the effectiveness of dieldrin applied to the mud walls of houses in malaria eradication zones.

First tests show that dieldrin applied to the walls gave satisfactory mosquito mortality—more than 40%—for 300 or more days. The insecticide was applied at the rate of 25 milligrams per square foot. The World Health Organization, the scientist reported, recommends applying 200 mg. per square foot.

Varying amounts of dieldrin, including the WHO recommendation, were tested on houses in 20 rural Mexican villages.

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SKULL RESTORATION—The 45,000-year-old skull of a Neanderthaler found in Shanidar Cave in Iraq has been pieced together and restored by Dr. T. Dale Stewart, anthropologist of the Smithsonian Institution. The primitive man apparently had been involved in fights since there was evidence of wounds that had healed before the final blow received when the roof of the cave fell in. The skull is of particular interest to anthropologists because it is so "young". No other remains of Neanderthal man have been found in the region that are so recent.

AERONAUTICS

Automatic Device Aids Bad Weather Flying

➤ AN AUTOMATIC device that helps keep small personal planes on course, even when hit by unexpected soupy weather, has been developed by scientists at the NACA's Langley Aeronautical Laboratory, Langley Field, Va.

The device, an aileron trim control, takes less power than the gyro stabilizers used for the same purpose in large aircraft. It will keep the airplane flying with wings level for an "indefinite period of time" without need for manual retrimming.

Drs. William H. Phillips, Helmut A. Kuehnel and James B. Whitten of the Laboratory have now reported success in testing the device to the National Advisory Committee for Aeronautics.

When pilots in small airplanes with only the basic instruments suddenly encounter very bad weather and cannot see the horizon, their sense of orientation is usually lost. This could mean going badly off course, or perhaps even crashing into the ground. To reduce such dangers, the scientists tested the automatic trim control.

The device, which can be engaged or disengaged as desired, will also help pilots hold the plane on a more constant course with less effort when flying through turbulent air.

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ANTHROPOLOGY

Study Vanished People

➤ NEW INFORMATION about the origin and ways of life of a puzzling vanished people of Arctic Canada is reported by Dr. Henry B. Collins of the Smithsonian Institution.

The people, the Sadlermiuts, were completely wiped out except for two children in an epidemic, probably typhoid, in the winter of 1902-03. That was before any scientists had had an opportunity to study them. But American, English, and Scotch whalers had described them as very different from other Eskimos. They lived in semi-subterranean stone dwellings. The men wore bearskin trousers and tied their hair in an enormous knot above the forehead.

It has been commonly thought that the Sadlermiut were the descendants of the Thule people who originated in Alaska and spread eastward to Arctic Canada and Greenland some 700 or 800 years ago.

Dr. Collins reports discovery of a "tremendous" Sadlermiut site at Native Point on Southampton Island, a bleak and treeless land mass forming the northwestern boundary of Hudson Bay.

In this abandoned "town" were found ruins of about 75 subterranean houses. The walls were made of stones and blocks of sod and the floor, roof supports, and sometimes even the roof itself were of stone.

More than 100 burials were found at the site itself and along adjacent beach ridges. In addition, human bones, the remains of the last of the Sadlermiuts who died in the epidemic, were found in some of the house ruins. The two surviving Sadlermiut children had previously been adopted by another group of Eskimos.

The ground outside the houses was littered with the skulls and bones of animals eaten by the Sadlermiuts, mainly seals, walrus, caribou and polar bears.

As a result of what Dr. Collins and his associates found at Native Point and a nearby site of the Dorset people, it seems very probable that the Sadlermiuts, instead of being descendants of the Thule people, had merely been influenced by Thule culture. The scientists found strong indications the Sadlermiuts were related to the Dorset culture. Even the Sadlermiut form of dwelling may have been borrowed from the Dorset Eskimos.

Radiocarbon dating of some of the charred mammal bones from the old Dorset site gave an age of at least 2,060 years.

The excavations of the early Dorset sites and Sadlermiut site gave a picture of cultural development in the frigid Arctic over a period of 2,000 years.

Dr. Collins' study, appearing in the Smithsonian's Annual Report, was made in a joint expedition of the Smithsonian, the National Museum of Canada and the National Geographic Society.

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GENERAL SCIENCE

Fair Goes International

➤ JAPAN has joined the National Science Fair, making this annual event for high school scientists international in scope.

The first of several countries making similar plans to join, Japan expects to send its two outstanding student exhibitors, a boy and a girl, to compete in the Ninth National Science Fair to be held in Flint, Mich., in May. The young Japanese representatives will be the winners of the Science Fair recently held in Tokyo and modeled on those conducted in the United States by Science Service.

Out of 20,000 entries submitted from all over Japan, 272 were chosen as finalists for the Second Japan Student Science Awards and Science Fair. Those judged top winners in the junior and senior high school divisions were given awards by the Prime Minister and the Education Minister on Nov. 4, 1957.

Emperior Hirohito of Japan lent his own collection of marine biology specimens to be exhibited at the Fair and received several of the finalists at the Imperial Palace. Ten boys and girls were invited originally, but when His Majesty heard that parents, teachers and 20 other finalists were waiting outside in a bus, he asked that all of them be included.

At the close of the Fair, the Takaaka Senior High School's marine biology project was taken to the Imperial Palace for the Emperor's inspection, at his request.

Fair exhibits were shown in various Japanese cities and towns to stimulate interest in this year's fair.

Japan's Science Fair is sponsored by the Yomiuri Shimbun of Tokyo and the Osaka Yomiuri Shimbun, leading newspapers, and the Japanese National Council for the Advancement of Scientific Education which includes many top government officials, educators and scientists.

Three official Japanese observers, who were guests at the Eighth National Science Fair in Los Angeles, in 1957, chose seven of the American projects and arranged, through the Asia Foundation, to have them shown in Japan as examples of United States fair exhibits. SCIENCE SERVICE cooperated also as adviser in the organization of Japan's fair.

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● RADIO

Saturday, March 15, 1958, 1:30-1:45 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Mr. George W. Bailey, executive secretary, Institute of Radio Engineers, New York, will discuss "New Radio Developments."

ELECTRONICS

SEAC Takes Pictures

Some of the winners of the 17th Annual Science Talent Search were present at the first public demonstration of a digital computer that can take pictures.

See Front Cover

➤ AN EXPERIMENTAL technique that uses a digital computer to scan and reproduce pictures has been shown by the National Bureau of Standards.

The first public demonstration of the picture-making ability of SEAC or Standards Electronic Automatic Computer, took place during the visit of winners of the 17th Annual Science Talent Search to the Bureau's laboratories.

The demonstration featured the scanning of a photograph of one of the young winners that was mounted in a newly developed device on a rotating metal drum and scanned optically by a photomultiplier cell.

The data received from the scanning was stored as numerical information in the memory of the computer by an automatic process involving some 30,000 digits. When this "image" was transferred electronically to an oscilloscope display device, the resulting picture was recognized by the high school seniors as that of one of their group, Paul Joseph Devine Jr., 17, of Gonzaga High School, Washington, D. C.

This experiment was developed by the data processing division of the Bureau to allow the automatic recording of data contained in pictures, diagrams and other graphic forms by a general-purpose digital computer such as SEAC. Machines to recognize printed characters have been developed, but they have required construction of specialized equipment for very specific functions.

For these preliminary experiments, simple question-answer routines have been worked out to enable SEAC to count the number of objects in a picture, evaluate the area of each object, and disregard irrelevant images such as specks of dust on the photograph.

Eventually a machine may be able to answer such specific questions about a photograph as "Does a house or road appear in the foreground?" or "What is the name and empirical formula of the organic chemical symbolized by this structural diagram?" It may also be possible for a computer to interpret patterns and classify objects in maps and aerial photographs.

During their tour of the Bureau's laboratories the young scientists were also given lecture-demonstrations on nuclear energy, free radicals and the properties of materials at high temperatures.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows a group of Science Talent Search winners at one of the Bureau demonstration and exhibition rooms. (Another group of students visited the Walter Reed Army Institute of Research and the Armed Forces Institute of Pathology).

Dr. A. T. McPherson, associate director, for engineering of the National Bureau of Standards, is speaking to the group while, seated at the right, Dr. Alan J. Goldman, a STS winner in 1949 and now with the Bureau, listens.

During their trip the students also heard talks by eminent scientists in government, industry and in academic research.

The visit was part of the five-day Science Talent Institute being held for the 40 top winners of the nation-wide Science Talent Search conducted each year by Science Clubs of America, administered by SCIENCE SERVICE.

STUDENTS WATCH SEAC—Three of the Science Talent Search winners, left to right, Robley Cook Williams Jr., Paul Joseph Devine Jr., and Jane Shelby, examine a photograph of Paul taken by the digital computer SEAC. The three high school students were part of a group visiting the National Bureau of Standards' laboratories.

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SURGERY

Surgery May Help Cancer to Recur in Body

➤ THE STRESS resulting from surgery for cancer increases the likelihood of a recurrence of the disease, two doctors from the University of Illinois College of Medicine reported.

Surgery is still the most effective method for treating cancer, however, Drs. Malcolm R. Lewis and Warren H. Cole told the Central Surgical Association meeting in Columbus, Ohio. They also pointed out that surgically-treated animals used in their studies lived longer than those not operated on, even though the spread of cancer increased.

The experiments were designed to find out if an operation or similar stress, with or without removal of the primary cancer tumor, might itself influence the subsequent growth of cancer elsewhere in the body.

Three sets of animals were inoculated with tumor-producing cancer cells. Each group was then subjected after various lengths of time to one of three kinds of stress.

Other groups of animals similarly inoculated with cancer cells were not subjected to stress. These were observed for comparison.

In each series of experiments, cancer spread much more rapidly among those groups subjected to stress.

Those animals operated on and subjected to the stress, lived longer, however, than those not operated on, even though the spread of cancer increased in the stress-subjected animals.

The explanation offered by the doctors centers around the possibility that the stress of the operation itself reduced the host's ability to fight the growth of cancer cells that had spread to other parts of the body.

The University of Illinois scientists are now engaged in perfecting mechanisms for neutralizing the decreased resistance to cancer which follows operation.

Science News Letter, March 8, 1958

AGRICULTURE

Vitamin C Spray Protects Plants Against Smog

➤ VITAMIN C sprays may be one answer to the multi-million dollar smog damage to agriculture.

After six months of preliminary field testing, two University of California scientists, Dr. Hugh T. Freebairn of the Citrus Experiment Station and Jackson Davidson of the Agricultural Extension Service, Riverside, Calif., reported that light application of ascorbic acid sprays prevented the burning and bronzing of leaves usually caused by the airborne oxidants in smog.

The spray also appears to increase the nutritive value of the crops, they said. Plants tested include lettuce, celery, pinto beans and petunias, while spray tests are now underway with orchids, roses, carnations, alfalfa, spinach and endive.

Plant cells already contain vitamin C and related compounds which, the scientists report, seem to help resist oxidant damage. The compounds work either directly, by destroying the toxic materials introduced with smog, or indirectly, by reversing the poisons' damaging effects on vital cell processes. Spraying increases the plant's ability to "fight back" against air pollutants.

The main significance of the success in field use of vitamin C is the demonstration that man can govern the effects on living cells of selective toxic agents in the air, Dr. Freebairn believes.

The University research is part of the statewide Air Pollution Research program being conducted at Riverside and was supported in part by funds from the Charles Pfizer Company.

Science News Letter, March 8, 1958

CHEMISTRY

Bactericidal Gas May Aid Sterilization

➤ A NEW BACTERICIDAL gas that promises to be highly useful as a sterilizer in operating rooms, hospitals and nurseries has been found.

The gas is known as beta-propiolactone. Developed by the U. S. Army Chemical Corps scientists, it was formerly used only in aqueous solutions.

The gas acts as effectively as formaldehyde vapor but works more rapidly and with fewer adverse side effects, Dr. C. R. Phillips, chief of the physical defense division, Army Chemical Corps., Fort Detrick, Md., said at Seton Hall College of Medicine and Dentistry, Jersey City, N. J.

Formaldehyde gas has many practical applications, particularly in treating large and relatively uncluttered enclosed spaces. Since it is not really acting as a gas, however, but traveling through the air in a gaseous form and condensing out only on all readily available and exposed surfaces, its use as a sterilizer has proved unsatisfactory.

A substance was needed that would sterilize woolen uniforms, potentiometers and articles requiring thorough sterilization.

Turning to ethylene oxide, Dr. Phillips said that scientists overcame the old hazard of flammability by mixing the highly flammable gas with carbon dioxide and fluorinated hydrocarbons (Freons).

The list of materials ethylene oxide will sterilize is impressive. It includes penicillin, hospital bedding, ophthalmic, urological and other types of medical instruments, eggs (through the shell), whole barrels of spice and even artery sections used for surgical transplants.

But the gas has disadvantages, Dr. Phillips pointed out, such as its slowness to react and its reaction to plastics and some rubber. It dissolves and slowly evaporates on both substances.

Dr. Phillips and his colleagues, Robert Hoffman and Benjamin Warshowsky, hope the value of the newly developed beta-propiolactone gas will lie in applications much along the line of those discussed for formaldehyde rather than as a substitute for ethylene oxide.

Its advantages over formaldehyde lie in its rapid action and ability to sterlize small enclosed spaces in fewer hours.

Science News Letter, March 8, 1958

GEOPHYSICS

New Theory Explains Strength of Sea Ice

➤ A NEW THEORY that explains the strength of sea ice and gives good agreement with measured values was reported to the Arctic Sea Ice Conference meeting in Easton, Md.

Both the theory and tests disprove the long-held rule that sea ice is only one-third as strong as fresh water ice. Sea ice many times has more than twice the tensile strength of fresh water ice, reported Dr. A. Assur, physicist with the U. S. Army's Snow, Ice and Permafrost Research Establishment.

The rule that sea ice is less strong than fresh water ice was developed by the Russian, K. A. Moskatov, in 1938. The new findings by Dr. Assur show sea ice strength can vary by as much as 30 times.

Salt water ice crystals actually consist of parallel plates of pure ice between which are sandwiched pockets of brine, he told the conference, which was sponsored by the National Academy of Sciences-National Research Council.

The ice itself undergoes continuing changes as temperatures drop. Pure ice is formed at zero centigrade, 32 degrees Fahrenheit, while the various salts contained in sea water precipitate out of solution at specific temperatures below that.

Sea ice becomes a complete solid at a temperature of 54 degrees below zero centigrade, or about 65 degrees below zero Fahrenheit.

The theory also accounts for the increase in friction encountered by sleds being driven over bare ice as air and surface temperatures drop.

The parallel ice plates and brine pockets, Dr. Assur reported, can be analyzed mechanically as a perfect plate. The stresses sea ice can withstand depend upon the spacing of the holes and their shape.

Science News Letter, March 8, 1958

IN SCIENCE

MEDICINE

Polio Shots Urged for Children Under Five

➤ A SPECIAL effort is being urged to have children under five years of age vaccinated against polio.

New evidence reveals this is the age group with the highest attack rate for paralytic polio, according to the U. S. Department of Health, Education and Welfare.

The highest polio attack rate, 5.7 per 100,000, during 1957 according to preliminary figures, was among children aged one year. The next highest rate was the two-year-old group with 5.5 and for all children through the age of four the rate averaged 4.4. Children between the ages of five and 19 averaged 1.4.

Over 30,000,000 cc. of vaccine, considered an ample supply, are available for the 40,000,000 persons in the 0-40 age group who have not yet had any of the shots.

Surgeon General Leroy E. Burney of the Public Health Service said he had called this information to the attention of the American Academy of Pediatrics and the American Academy of General Practice and that both will encourage vaccination of children under five.

Science News Letter, March 8, 1958

GENERAL SCIENCE

Scientists' Group Urges Civilian Space Agency

➤ DEVELOPMENT and control of outer space should be directed for peaceful purposes by a civilian agency, the Federation of American Scientists has urged.

The scientists' organization, which 12 years ago was effective in gaining civilian control of atomic energy from the military, further urged that "all outer space research" by scientists of any nation be carried out by an international agency under the United Nations.

Placing the U. S. space program in a non-military framework, the Federation's council said, would help to guarantee that efforts of nations crossing the space exploration frontier be limited to peaceful uses.

Sen. Clinton P. Anderson (D.-N. Mex.) in January introduced a bill that would place U. S. space research under the Atomic Energy Commission. Hearings on this bill, which would also authorize a new national laboratory for space research, were held before the new Subcommittee on Outer Space Propulsion of the Joint Atomic Energy Committee.

The Federation of American Scientists is an organization of more than 2,000 scientists and engineers concerned with the interrelations of science and world affairs.

Science News Letter, March 8, 1958

CE FIELDS

BIOPHYSICS

Brain Responds Positively When Noise Is Turned Off

➤ THE CENTER of hearing in the brain responds with an electrical signal when a noise is turned off, and this "off" response is quite different from the corresponding response when noise is turned on. This is indicated by studies of cat brains, Drs. Nelson Y. S. Kiang and Thomas T. Sandel of the Research Laboratory of Electronics, Massachusetts Institute of Technology, reported to the Biophysical Society meeting in Cambridge, Mass.

Drs. Kiang and Sandel had previously described an electrical response in the brains of unanesthetized cats when a burst of noise is turned "off." Analysis of the response with the help of an electronic computer showed that varying the characteristics of the burst of noise had a negligible effect on the "off" response. However, when the cat was anesthetized with Nembutal, the "off" response disappeared while the corresponding "on" response remained essentially unchanged.

New studies show that the "off" response is localized in a different area of the hearing center, or auditory cortex, from the "on" response. Also, when an "off" response occurs at the same time as an "on" response, the total pattern of response is markedly different from the pattern produced by two "on" responses.

This proves, the scientists believe, that the mechanism generating the "off" response must be different from that producing the "on" response. They say the "off" responses may prove to play an important part in the way that responses to sound are coded in the brain.

Science News Letter, March 8, 1958

MEDICINE

Tranquilizer May Not Be Habit-Forming

➤ MEPROBAMATE, a tranquilizer in wide use today, did not prove habit-forming in a study of 60 prison inmates, contrary to expectations.

The results of the prison study are reported by Austin R. Stough of McAlester, Okla., in the *Journal of the American Medical Association* (Feb. 22).

Meprobamate, marketed as Miltown and Equanil, was tested by Dr. Stough to evaluate the possibility of habituation among a prison population in which a high incidence of susceptibility might normally be expected.

The inmates in the Oklahoma state prison given the drug were considered to be highly unstable with a history of injury, illness or other physical or psychological abnormality. Several of the inmates had been former addicts to narcotics or alcohol.

The tranquilizer was given in two separate six-week tests. In the first, meprobamate was administered in dosages far in excess of amounts needed to allay symptoms. This was followed by abrupt withdrawal.

During the second phase, the drug was given in dosages more commonly used, and followed by gradual withdrawal.

None of the prisoners developed a true habituation to the tranquilizer. The results show, however, that prisoners with serious nervous disorders had an undesirable reaction to abrupt withdrawal of the drug. All returned to pretreatment status within 48 hours.

Dr. Stough recommends that withdrawal from any tranquilizer be graduated and extend over a period of time.

Earlier studies by other scientists in which mice were subjected to high dosages of meprobamate showed the animals became dependent upon increasing amounts of the drug in order to obtain the same effect as on original smaller doses.

An earlier study with humans reported by a Seattle physician, Dr. Frederick Lemere, showed several of his patients developed symptoms such as nervousness, "the jitters," and "that let down" feeling when they missed their usual dosage of meprobamate.

Science News Letter, March 8, 1958

MEDICINE

Liver Function Test Indicates Treatment

➤ SHOULD the patient with a liver disorder be treated medically or surgically?

This question can be answered by a new liver function test developed at the Atomic Energy Project of the University of California at Los Angeles by Drs. George V. Taplin, Orsell Meredith and Harold Kade.

The technique employs a radioactive dye, Rose Bengal, and a simple external radioactivity counting procedure.

The test measures liver vascularity, liver cell function, and biliary tract potency and/or bile flow interference directly.

Readings on these separate functions have proved valuable clinical aids in distinguishing whether jaundice is due to primary liver cell damage or indirectly to blockage of the biliary tract. The former would be treated medically, the latter surgically.

Accurate decisions on the type of treatment must be made as quickly as possible. With standard laboratory liver tests and clinical information, such a decision may require long periods of observation by the physician, up to several weeks in many instances.

In such difficult cases the new atomic liver test, which may be repeated frequently without harm to the patient, provides diagnostic clues much more rapidly than do indirect laboratory tests. In many instances it gives conclusive diagnostic data immediately.

The test is now being used in diagnosis of a variety of other liver disorders at many hospitals and clinics throughout the nation and in several foreign countries.

Science News Letter, March 8, 1958

BIOLOGY

Aging of Space Traveler Is Biological Problem

➤ WHETHER a fast-moving space traveler ages more slowly than his stay-at-home twin is actually a biological problem, not a physical one of measuring time.

Dr. Anderson Nettleship of the University of Arkansas' Medical Center recommends in *Nature* (Feb. 22), that the biological problem be tested by experiments.

If growth and aging are connected with high speeds in the way physicists assume, living processes could be modified almost at will by varying the velocity, Dr. Nettleship says. However, everything known about protoplasm shows it is not possible to retard or reverse living processes, although they may be temporarily suspended under certain, very limited conditions.

Dr. Nettleship suggests that biological systems function in a manner entirely different from the atomic particles thus far tested for differences in lifetimes when moving fast compared to when moving more slowly.

If biological time is not the same as time measured by the physicist, then the current arguments concerning whether or not space travelers would be as old as stay-at-homes upon their return are meaningless so far as biological processes are concerned.

The question of aging at high speeds, which arises from the so-called "clock paradox" of Einstein, has been the subject of much heated debate in scientific publications the last few years. Scientists who have studied Einstein's theories carefully have no doubt that one logical result would be that time is slowed when objects, either men, clocks or atomic particles, travel at speed close to that of light.

Science News Letter, March 8, 1958

GENERAL SCIENCE

Research, Development Done by 230,000 Persons

➤ THERE WERE 230,000 scientists and engineers engaged in research and development activities in the natural sciences in 1954, according to the latest information available and released by the National Science Foundation.

The NSF report, based on a series of surveys, shows the 230,000 persons represented only 25% of all engineers and 40% of all scientists employed in the organizations queried.

Of the total for 1954, 68,000 were physical scientists, 139,000 engineers and 22,000 life scientists.

Sixty-eight percent of the physical scientists were employed by industry as well as 84% of the engineers. More than half of the life scientists, on the other hand, found their bread and butter in colleges and universities.

The 230,000, the NSF reported, were engaged in research and development activities worth approximately $5,400,000,000.

Science News Letter, March 8, 1958

TECHNOLOGY

Modern Chimney Sweeps

Modern machines and electrical devices in factory chimneys, waste gas outlets and even in our homes, work to keep the air clean.

By DAVID PURSGLOVE

➤ MODERN "CHIMNEY sweeps" are hard at work helping to keep America's air safe to breathe.

The chimney sweeps who get most of the glory are working in the giant smokestacks and gas systems of huge factories.

Others do not work around chimneys at all, but in tanks of water. However, they are not cleaning water, but still doing the chimney sweep's job of cleaning up and hauling away smoke and dust.

And there may even be yet another type of chimney sweep hard at work right now in your home, local restaurant, bakery or department store.

These are not the little dirty-faced, grimy-clad young boys of early England who periodically crawled into chimneys and swept down the soot. They are, instead, modern mechanical and electrical devices that work continuously and automatically to eliminate soot even before it forms.

Thanks to these machines, the air we breathe is cleaner and fresher than would otherwise be possible in a highly industrialized nation.

Although many industries have adopted smoke-cleaning devices to maintain good community relations or to comply with local laws, at many factories the cleaner and fresher air is only a by-product of a more important, dollar-wise, function of smoke cleaning. These devices save industry millions of dollars a year that would otherwise literally go up in smoke.

Valuable, often strategic, materials are reclaimed from smokestacks, particularly in the chemical and metallurgical industries.

In some industries careful policing of smoke is an absolute necessity for protection of life. The ores of many metals vital to the electronics industry contain arsenic compounds that must not be allowed to drift over the countryside.

Four Kinds of Sweeps

Although there are nearly as many different techniques for cleaning smoke as there are plants to employ them, the majority of them fall into one of four major categories: scrubbing, centrifuging, filtration, electrostatic precipitation.

Scrubbing, as the term implies, simply is a matter of passing a factory's gases and smoke through tanks of water or water spray towers which remove objectionable impurities. The gas flow then is dried and released into the atmosphere.

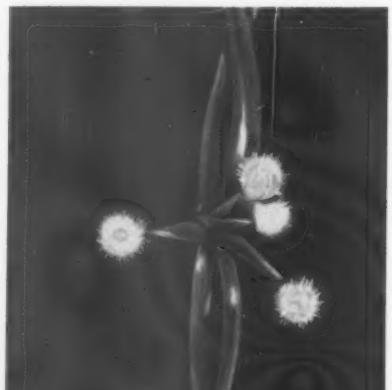
Sometimes the water is treated with chemicals which react with the gas or its solid-particle content to form either harmless compounds or compounds which are retained in the scrubbing solutions. This is particularly true in the case of materials which form acids in moist atmospheres. The scrub water is treated with caustic potash which neutralizes acids.

The high speed of flow of hot gases from many industrial processes is utilized to remove solid particles by centrifugation. This is similar to the use of laboratory centrifuges to separate solids from liquids. A test tube containing a liquid with solids in suspension is whirled at a high speed. The force of gravity draws the solids to the bottom of the tube.

In removing solids from smoke, the gases are passed at high speed through spiral coils which whirl the gaseous suspension. The gravitational force thus created draws out the heavier solids and permits the lighter gases to continue out the stack.

A modification involves passing the gases through a tank containing baffles. The gases are able to negotiate the sudden change in direction, but the heavier particles continue in a straight path and are trapped.

Familiar, everyday examples of smoke cleaning by filtration may be seen in filter-tip cigarettes and ordinary household vacuum cleaners.



MODERN CHIMNEY SWEEP — Barbed wire similar to farm fencing has been used by engineers of Koppers Company, Inc., Baltimore, Md., to solve a smoke cleaning problem nearly 50 years old. The electrical discharge needed to capture smoke particles is not hindered by a build-up of smoke on this wire. The barbs remain clean and "sparkling."

A filter mat made of wool or cotton waste, shredded and matted asbestos, specially prepared paper, steel wool, spun glass or packed chemicals is placed in the gas flow lines to trap solid particles of ash, oil smoke, metallurgical ores and other materials that comprise smoke.

Such filters are often used at air ducts into a plant to protect machinery and sensitive processes from the grinding or chemical effect of impurities. When used to eliminate smoke from waste gases, the filters often must be placed after a tank or tower that first cools the gases to prolong the filter life.

However, some filters, particularly those made of asbestos or metal "wools," can be used directly in smokestacks and effectively remove particulate matter from gases up to around 1,000 degrees Fahrenheit.

Some filters actually are only skeleton structures to support liquids which do the filtering. One type in wide use consists of an endless belt of steel mesh which passes through an oil bath and then through a portion of the exhaust gas pipe or smokestack. Oil trapped in the mesh collects smoke and dust particles.

Bagging the Smoke

Bag-type filters, quite similar to the dust collecting bags in vacuum cleaners, also are in wide use. Most of these rely on a very fine weave to mechanically trap dust and smoke particles. Others, however, are designed to take advantage of the fact that most small particles to be trapped carry a slight electric charge. Various fabrics possess slight charges, usually from the time of their manufacture. When a fabric carrying a charge opposite to that on the dust particle is used as a filter the bag will stop, by electrostatic attraction, much smaller particles than could be stopped mechanically by the fabric weave alone.

The smoke and dust collectors most often heard about utilize an electrostatic attraction created artificially. These are the very expensive, but highly efficient, electrostatic precipitators.

A wire suspended in the smokestack, or several wires arranged in units occupying their own buildings in the exhaust gas system, imparts an electrical charge to the smoke particles. Near the wire are metal plates carrying an opposite charge which attract the charged particles.

Only recently a major problem of electrostatic precipitator designers for nearly 50 years was overcome.

Ideally, all smoke particles would be attracted, electrically, to the charged plates. However, in practice, some smoke adheres mechanically to the energizing wire, producing an insulating effect that can be overcome only by increasing the power load.

When the wire becomes coated, there is no longer any control over where and when

the charging field will build up around the wire. The use of barbed wire has solved the problem.

Earlier, scientists in Europe learned barbed wire points always remain clean and provide a continuous electrical discharge. By properly spacing the barbs, engineers can control the discharge throughout the entire precipitator.

Laboratory and pilot plant models were built in Europe by Dr. W. T. Cosby of W. C. Holmes & Co., Ltd., Huddersfield, England, and Fred Frauenfelder of Elex, Ltd., Zurich, Switzerland. The first full-scale barbed-wire precipitator was built in the United States under the direction of J. Marcus Mousson, Metal Products Division, Koppers Company, Inc., Baltimore, Md., in cooperation with the European engineers.

Dust Removal by Electricity

Electrostatic precipitators, as well as filtering devices and a few modified scrubbers, are in daily use in many homes and business places.

An ingenious and very simple modification in electrostatic precipitators for home, office and store use has been made by Electro-Air Cleaner Company, Inc., McKees Rocks, Pa. This provides a greater particle collecting surface in a smaller space.

Unless influenced by magnetic or other electrical fields, electricity and particles electrically charged will travel in the straight line that is the shortest distance between electrodes. Thus, dust and smoke collected in a precipitator will form a straight line down the charged plates, following the parallel straight line formed by the hanging electrode. This is a trace of the shortest straight path between the charging wire and collecting plate.

However, in the case of an electrode hanging exactly in the center of a circular cylinder, all points on the cylinder are equidistant from the electrode.

Electro-Air Cleaner engineers have devised a unit featuring a rigid energizing electrode suspended between two curved collecting plates, each a segment of a circular cylinder. Dust is collected over most of the interior surface of the unit, which can be made quite small in contrast to a precipitator featuring flat plates.

Other methods of eliminating smoke and dust particles from smoke and household air include impaction, agglomeration and settling.

Gases to be cleaned by impaction are hurled against rods, cylinders or screens which trap particles impacted on them. Filtering is a type of impaction.

The technique of agglomeration consists of treating the particles chemically, mechanically or electrically to cause many small particles to coagulate into larger particles for easier removal. Agglomeration often precedes filtering, centrifuging or settling.

Settling can be used in unit operations or in small continuous operations in which waste gases can be allowed to collect in tanks stored long enough to permit suspended particles to settle to the bottom.

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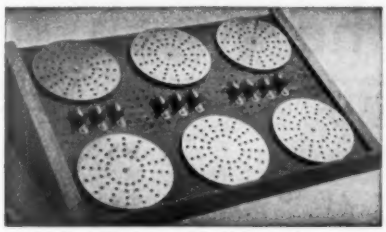

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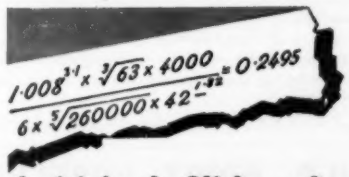

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THE ABC OF ACID-BASE CHEMISTRY: The Elements of Physiological Blood-Gas Chemistry for Medical Students and Physicians—Horace W. Davenport—*Univ. of Chicago Press*, 4th ed., 87 p., illus., paper, $2. A guide to a subject that has always been difficult for a student to understand.

THE ADMIRABLE DISCOURSES OF BERNARD PALISSY—Translated by Aurèle La Rocque—*Univ. of Illinois Press*, 264 p., $5.50. Making available for English-speaking readers some of the rare writings of a remarkable pioneer in geology and agricultural science.

THE AUTOBIOGRAPHY OF AN IDEA—Louis H. Sullivan, Foreword by Claude Bragdon and new introduction by Ralph Marlowe Line—*Dover*, 333 p., illus., paper, $1.85. The autobiography of a leader of American architecture. New student edition.

BRAINSTORMING: The Dynamic New Way To Create Successful Ideas—Charles H. Clark—*Doubleday*, 262 p., $4.50. Describing a method, recently become very popular especially in advertising agencies, for developing new ideas by thinking aloud in groups.

COLLEGE PLANE GEOMETRY—Edwin M. Hemmerling—*Wiley*, 310 p., illus., $4.95. For a one-semester course. Introducing various types of reasoning.

CUT YOUR READING TIME IN HALF—*Reading Laboratory*, 58 p., illus., paper, $1. To help you read faster and get more out of it.

EDUCATION AND HUMAN RELATIONS—Ashley Montagu—*Grove*, 191 p., paper $1.45, cloth $3.50. Presenting the anthropologist author's belief that the primary purpose of education is training in the theory and art of human relations.

EXCAVATIONS IN THE MCNARY RESERVOIR BASIN NEAR UMATILLA, OREGON—Douglas Osborne, appendixes by Marshall T. Newman, Arthur Woodward, W. J. Kroll and B. H. McLeod—*Govt. Printing Office*, Smithsonian Bulletin 166, 258 p., illus., paper, $1.75. Reporting remains of people who were burying their dead in plank chests, perhaps just before Lewis and Clark went down the Columbia in 1805.

GROUP LEADERSHIP IN STAFF TRAINING—Eileen A. Blackey—*Govt. Printing Office*, Bureau of Public Assistance, 182 p., paper, 55¢. Addressed especially to social workers, this booklet also offers guidance to other group leaders.

HIGH SCHOOL PHYSICS—Oswald H. Blackwood, Wilmer B. Herron and William C. Kelly—*Ginn*, rev. ed., 808 p., illus., $5.20. For high-school students who want to go on to college.

THE HIGHFIELDS STORY: An Experimental Treatment Project for Youthful Offenders—Lloyd W. McCorkle, Albert Elias and F. Lovell Bixby—*Holt*, 182 p., illus., $3.50. Reporting an experiment in "curing" delinquency by inducing the offenders to change their attitudes so that they no longer think of themselves as delinquents.

HOW DOES A GARDEN GROW?—Ann Towson Brown—*Dutton*, 48 p., illus. with beautiful photographs by Peggy Plummer Sanders, $2.50. Telling, in storybook form, how to grow flowers and edible plants.

LAND OF THE TOLLUND MAN: The Prehistory and Archaeology of Denmark—Palle Lauring, translated by Reginald Spink—*Macmillan*, 160 p., illus. with photographs by Lennart Larsen, $6. A beautiful book about prehistoric man and his handiwork.

MY HOBBY IS COLLECTING ROCKS AND MINERALS—David E. Jensen—*Childrens Press*, 122 p., illus., $3.95. Advice, information and inspiration for the young rock collector.

NAVEN: A Survey of the Problems Suggested by a Composite Picture of the Culture of a New Guinea Tribe Drawn From Three Points of View—Gregory Bateson—*Stanford Univ. Press*, 2d ed., 312 p., 28 Pl., $6. A new edition of this work on the theory of culture first published in 1936 and long out of print.

OBSERVATION AND INTERPRETATION: A Symposium of Philosophers and Physicists—S. Korner, Ed.—*Academic*, 218 p., illus., $8. Papers discussing topics such as the application of mathematics to the physical world.

THE ORGANISATION OF SCIENCE IN ENGLAND: A Retrospect—D. S. L. Cardwell—*William Heinemann*, 204 p., $2.55. Covering the interrelations between science and society.

PARENT-CHILD TENSIONS — Berthold Eric Schwarz and Bartholomew A. Ruggieri—*Lippincott*, 238 p., $4.95. A psychiatrist and a child specialist advise parents in non-technical language on how to deal with the emotional development of their children.

PLASTIC SHEET FORMING—Robert L. Butzko—*Reinhold*, 181 p., illus., $4.50. A reference work for those in the industry.

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THE PRINCIPLES OF QUANTUM MECHANICS—P. A. M. Dirac—*Oxford Univ. Press*, 4th ed., 312 p., $5.60. The main change in this new edition is that the chapter on quantum electrodynamics has been rewritten.

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Science News Letter, March 8, 1958

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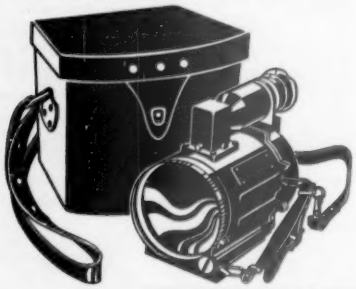

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MEDICINE

Method Spots Tumors Early

➤ A METHOD for spotting cancers "very early" in their growth stages was suggested to the National Academy of Sciences-National Research Council.

The method combines studies with ultraviolet and visible light, X-rays, and automatic scanning and computing equipment to allow following biochemical changes in individual cells as they occur. The changes caused by a virus attacking a host cell are "very apparent" within an hour after infection, reported Prof. Torbjorn O. Caspersson of the Royal Caroline Medico-Surgical Institute, Stockholm.

He said the technique, known as optical cytochemical, also offered a way to study some of the many factors involved in cancer development as well as for diagnosing early cancers. The method is sufficiently delicate to give quantitative results even on such tiny particles as the individual gene-carrying materials, the chromosomes.

Combining automatic computers with automatic scanning instruments has yielded a method for measuring thousands of points in each individual cell within a reasonable time. Previously cells were destroyed during the long working times required.

Dr. Caspersson said his studies had shown there were many differences in composition of advanced tumor cells, and that these differences change under the influence of such factors as chemicals or irradiation.

"In many cases these changes are such that parts of the cells die," he said, "and the parts selected out survive and multiply under the new conditions."

Dr. Caspersson cited the influence of the chemical agent, amethopterine in an ascites, or abdominal, tumor. In this case, a special cell line is selected out, "quite different from the original one." He said this was an example of how cytochemical analysis leads to studying the mechanism of cancer growth, which underlies sudden changes in growth rate.

Science News Letter, March 8, 1958

Do You Know?

Common *eels* spawn in the ocean and ascend into fresh waters to mature, returning later to the ocean as adults to complete the life cycle.

An *ankle sprain* should heal in about six weeks, but some continue to give pain for months and even years.

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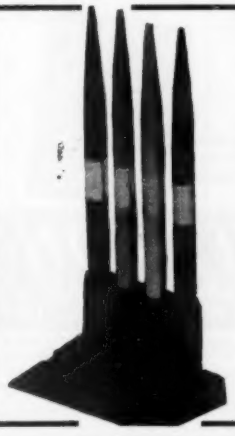

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GEOLOGY

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A geologist has reported that the odor of hydrogen sulfide gas can be used as a reliable clue to uranium deposits. Mead L. Jensen, assistant professor of geology, Yale University, said the gas has been present in uranium ore samples collected from many western United States locations.

The discovery means accurate, high-speed laboratory techniques can supplement the slow geiger counter method of prospecting for the vital metal. It also means the supply of uranium may be much larger than previously suspected, for hydrogen sulfide has always been associated with petroleum fields.

Prof. Jensen theorized that water, carrying uranium washed out of volcanic ash more than 60,000,000 years ago in the Colorado Plateau, reacted with hydrogen sulfide formed from decaying animal and vegetable matter to produce uranium oxide, which is still there awaiting prospectors.

Science News Letter, March 8, 1958

Questions

ENGINEERING—What is it that actually heats the rooms in a solar-heated house? p. 147.

GEOPHYSICS—Is sea ice stronger or weaker than fresh water ice? p. 152.

PUBLIC HEALTH—What are two mosquitoes known to carry yellow fever? p. 149.

TECHNOLOGY—What are four ways dust can be removed from air? p. 154.

Photographs: Cover, pp. 149, 151, Fremont Davis; p. 147, Massachusetts Institute of Technology; p. 148, Lockheed Missiles Systems Division; p. 154, Koppers Company, Inc.; p. 160, Master Specialty Co., Inc.

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Science News Letter, March 8, 1958

TELEVISION PROGRAM FINDER can tell you at a glance what channels are carrying your favorite programs. Pet programs are identified on a peg-board by varicolored plastic pins. Each pin represents a different channel. The day of the week and time of day are listed on the styrene plastic board.

Science News Letter, March 8, 1958

DISPOSABLE SYRINGES are designed for applying bonding agents, potting compounds and other uses. Molded of polyethylene plastic, each syringe has a tapered tip so that orifice diameters may be enlarged by cutting back the tip. There are also steel one-and-one-half-inch hollow needle tips.

Science News Letter, March 8, 1958

LAWN AND HEDGE TRIMMER connects to garden hose and is powered by water pressure. The trimmer, shown in the photograph, has a four-inch, four-tooth rotary blade. The two-and-one-half-pound

cutter rolls along next to walls and under shrubbery on plastic wheels. It has a detachable handle and built-in water control valve.

Science News Letter, March 8, 1958

DRAWING KIT FOR THE BLIND produces raised lines on a thin plastic film by the use of a small ball point pen and a rubber-surfaced writing board. Firm writing pressure with the inkless pen results in a series of tiny bumps that appear as raised lines on the upper surface of the film and can be traced with the fingertips.

Science News Letter, March 8, 1958

CONTOUR TOOL is a scriber that can be used for fitting linoleum, tile, wood, plastics and sheet metals around pipes, cabinets, door sills and frames. It marks circles or scrolls from one to 25 inches in diameter and follows irregular, uneven lines and surfaces.

Science News Letter, March 8, 1958

SHOP VERNIER CALIPER of stainless steel has a dull chromium finish to reduce glare when reading the scales. It is designed for measuring of outside, inside and depth dimensions with a measuring capacity of five and five-sixteenths inches. Graduations are 1/1000 inch on the lower scale and 1/128 inch on the upper scale.

Science News Letter, March 8, 1958

EXERCISE DEVICE can be set up and used anywhere in the house. Exercising action is similar to that of riding a bicycle, but instead of pedals, the user puts his feet into rope stirrups that operate on a pulley. Stand and handles are of tubular steel and the exerciser is compact enough to fit into a dresser drawer.

Science News Letter, March 8, 1958

Nature Ramblings

By HORACE LOFTIN

TIME AND AGAIN, the hard but honest gaze of a scientist has stared away our myths, superstitions and favorite beliefs, supplanting supposition with fact. We live in a better, healthier world because of this.

But sometimes we might wish there were a bit more sentiment in science as some fine old belief tumbles. Take the case of the rabbit.

We all grew up with Aesop's, Uncle Remus' or Walt Disney's stories about what a smart, handsome and lovable rodent Br'er Rabbit is. Even a 1954 edition of Webster's dictionary defines the rabbit as "burrowing rodent." However, the consensus among mammalogists today is: The rabbit is not a rodent!

Why not? And if not, what is old Br'er Rabbit?

The kind and structure of teeth form one of the most important means of classifying

Two Extra Teeth

the different orders of mammals. They give a world of information about the habits and family relations of the animals. Now, for a long time the teeth of the rabbits, hares and pikas have been troubling the specialists.

Typical rodents have no more than two upper and two lower incisor teeth, the gnawing tools they use so efficiently. Rabbits and their kind have four upper incisors! Granted, the extra two teeth are small and without the cutting edge of the middle, rodent-like incisors. But this, plus a few other irregularities, was enough to have them stricken from the Rodentia and elevated to an order of their own, the Lagomorpha.

(Until not too many years ago, and even now, for some scientists, this group of animals was placed in a separate suborder of the rodents.)

The North American lagomorphs consist of the rabbits, hares and the little-known pikas. The pikas, which live on the slopes of our western mountains, look something like the common guinea pig. Their hind legs are not elongated like those of the rabbits and hares.

While other features set them apart, rabbits differ from hares in one striking respect. The young rabbits are born naked, blind and helpless, while newborn hares come with eyes open and body well furred. Thus, the baby hare is on his own long before his pampered cousin.

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